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Identifying, Scouting and Management of Bacterial Leaf Streak

Ethan Stoetzer
Iowa State University, stoetzer@iastate.edu

Edward R. Zaworski
Iowa State University, zaworski@iastate.edu

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Abstract
Iowa State University Extension and Outreach plant pathologists have identified and confirmed several different cases of bacterial leaf streak in corn this growing season. Bacterial leaf streak is relatively new to the United States, with the first case identified in 2016, though symptoms of the disease have been present in Nebraska since 2014. To date, the disease has been reported in nine states including: Colorado, Illinois, Iowa, Kansas, Minnesota, Nebraska, Oklahoma, South Dakota and Texas.

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Watch a video on testing and sampling for bacterial leaf streak!

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Scouting and identifying

Because the disease isn't widely recognized and can often be misdiagnosed in fields, it's important to understand how to properly scout for and identify this unique disease.

Bacterial leaf streak is caused by the bacterium *Xanthomonas vasicola*, and has been observed on field corn, seed corn, popcorn and sweet corn. Symptoms begin as narrow leaf lesions with wavy edges that occur between the veins of corn leaves and can range between one-to-several inches long. Lesions may be yellow, tan, brown or orange and look greasy or water-soaked. These lesions can occur anywhere on the leaf blade, sometimes close to the midrib, and can appear translucent with bright yellow halos, which when backlit, are easy to see extending from the lesions. Over time, these lesions can expand to cover larger areas of the leaf. In extreme cases, these lesions may extend along the entire length of the leaf, and grow together to form large, necrotic areas.

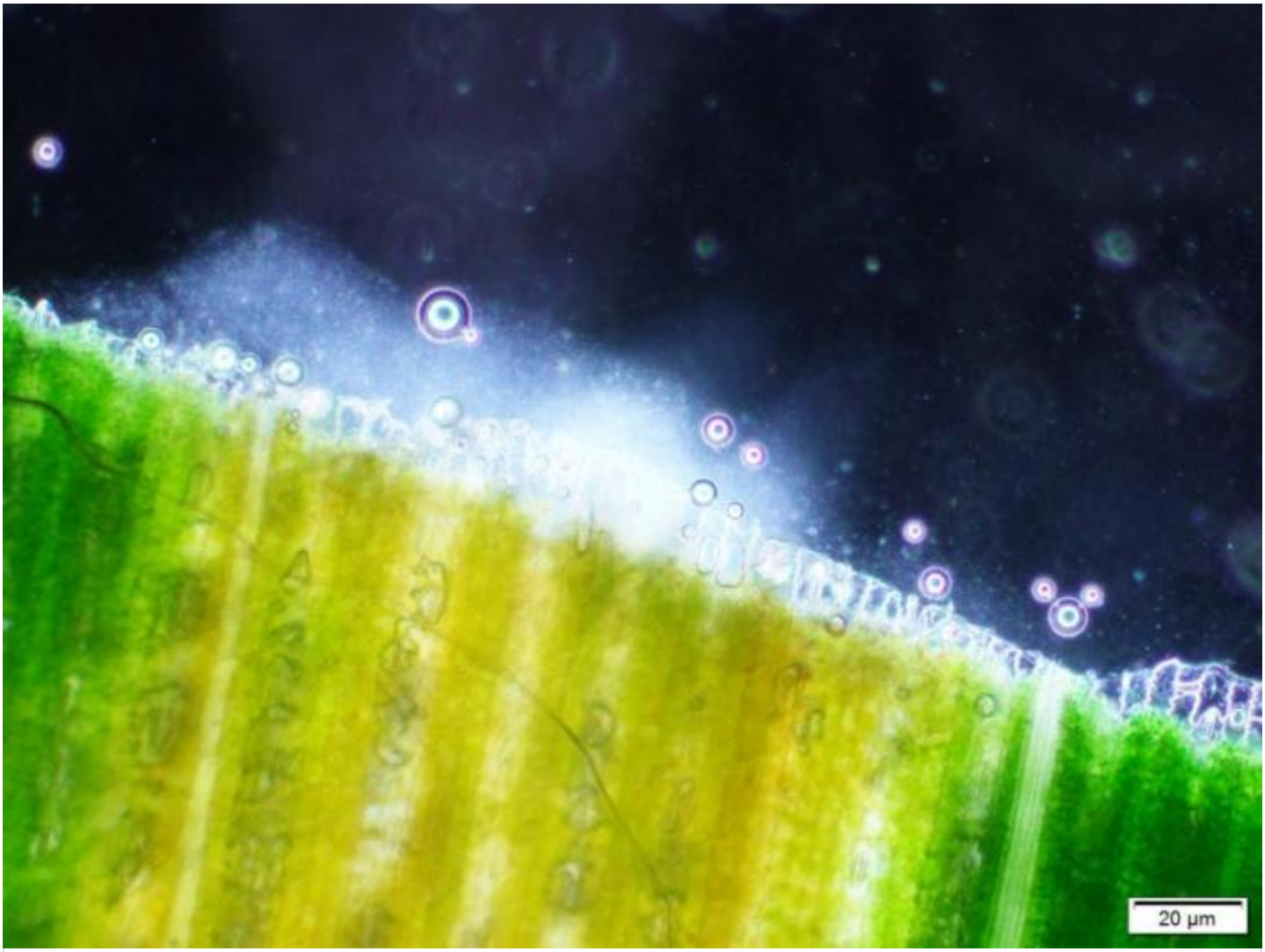
Yellow, tan and brown lesions form in bands across the leaf blade. Holding the sample up to the light will sometimes illuminate these bands to aid in diagnosis.

Not much is known about the disease cycle of bacterial leaf streak, due to the recency of the identification in the U.S. Researchers presume that the bacterium overwinters in infected crop residue because the disease has been observed on volunteer corn present in a soybean field, where the disease had been identified the previous year in corn. It is assumed that irrigation, splashing rain and wind-driven rain spread the bacterium, but it is unknown how far the bacterium can travel. It is also assumed that a plant needs to be wounded for infection to occur.

Disease symptoms have been observed in corn as early as the V7 growth stage, in which lesions first appear on lower leaves, though because of the disease's recent arrival to the Midwest, not much data has been collected on the earliest appearances of the pathogen for scouting windows. Under favorable conditions — continuous corn production, overhead irrigation or rainfall during hot weather — the disease spreads up the plant canopy, though symptoms could also appear only in the upper canopy. Symptoms in the upper canopy are more common when the disease occurs after tasselling. Some reports indicate that bacterial leaf streak appears after high wind and rain events. Under these favorable conditions, disease severity can approach 30 percent.

Similar diseases

Scouting for bacterial leaf streak can be difficult, as its symptoms can be mistaken for other common diseases; grey leaf spot and common rust. A laboratory can easily distinguish bacterial leaf streak from fungal diseases through bacterial streaming. Bacterial streaming is an identification process that entails placing a small section cut from the edge of a leaf lesion in a droplet of water on a microscope slide. Under a microscope, you can observe the bacterial cells streaming out from the cut edge of the lesion. However, under a microscope, other bacterial diseases also produce this streaming, so you should confirm the presence of the bacterium by sending a sample to the Iowa State University Plant and Insect Diagnostic Clinic.



An example of bacterial streaming. When water is applied to the infected tissue sample and viewed under a microscope, the bacteria will stream" out of the sample and into the water. *Edward Zaworski*

Management

Currently, there is little information available when it comes to managing bacterial leaf streak. Field observations suggest that corn hybrids differ in susceptibility. Once hybrids can be screened for resistance, using resistant hybrids will be the best way to manage bacterial leaf streak. Like other bacterial diseases (such as Goss's wilt) there are no effective chemical controls. Researchers do not recommend tillage to reduce the risk of bacterial streak, due to the need to manage soil erosion. While bacterial leaf streak has been most commonly observed in overhead-irrigated fields, it is also known to occur under both flood irrigation and dryland conditions.

Yield impacts

Likewise, researchers only have limited information about bacterial leaf streak's impacts on yield. Researchers anticipate losses to be minimal if symptoms develop late in the season, or if extensive leaf blight does not occur before or during grain fill.

Category: Plant Diseases

Crop:

Corn

Tags: bacterial leaf streak Corn disease Corn disease

Authors:

Ethan Stoetzer *Communications Specialist II*

Edward Zaworski *Plant Pathology Diagnostician*

Edward R. Zaworski is a plant diagnostician in the Iowa State University Plant and Insect Diagnostic Clinic. He earned his master's degree in plant pathology in 2010, with a focus on field crop diseases.

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